**XML**

**XML - Extensible Markup Language**

XML is a meta-language used to create other XML documents and other vocabularies for specific purposes. It describes basic rules and syntax that XML documents must follow instead of a specific vocabulary itself.

* X - Extensible: Tags extend use beyond original intended use
* M - Markup: Data surrounded by tags which add meaning
* L - Language: Communication method

**Applications**

* Instance Document .xml: contains the data
* Schema Document .xsd : describes allowed structure (data types, element names) of instance document
* Stylesheet .xsl: formatting instructions for data in the instance document

**Element** - a matching beginning and ending tag name, and its contents, or an empty element. It is the basic unit of content in an XML document. An element can have one and only one parent, except the root element.

**Simple Element** – elements containing data values

**Complex Element** - elements containing other elements nested within them (complex - parent) or elements with attributes (complex - attribute)

**Empty Element** – not containing any data value or other elements nested within; opens and closes in the same tag

<Address addressType="billing" sameAsShipping="yes"/>

**Hierarchy**

* **Prologue -** containing processing instructions to be used by an XML processor and comments

<?xml version="1.0" encoding=UTF-8”?>

<!-- Enter comments here -->

* **Root Element** - the first element and the parent element for the entire XML document, enclosing all the other elements nested within it. The ending root element name is the last one in the document. The root element’s name should reflect the contents and purpose of the document.
* **Parent Element** - contains other elements nested within it and represents information about one instance of an entity
* **Child Element** - enclosed by the parent element and represents attributes describing the Parent Element

**XML Specification 1.0** - defining rules and syntax that XML documents must to follow to be well-formed and valid

**Well formed document** – follow basic rules for all XML documents and can be processed by an XML processor

**Valid document** – a well-formed document that has been validated against rules in its XML schema document

**Rules**

* The first line of an XML document is the **prologue**
* An XML document has one and only one **root element**
* All elements must have a matching set of **opening tag** <> and a **closing tag** </>

XML documents can also have “empty element” that have no data value or other elements

* All elements must be **properly nested**, closing the tag that was opened last (LIFO)
* All elements can have **attributes**: additional data about a specific element, having a name-value pair in the format: attributeName=“attribute value” and appear within the beginning element name <>.

<PriceAmount currencyID="USD">32.99</ PriceAmount>

<BaseQuantity unitCode="UNIT">32.99</ BaseQuantity>

**Advantages**

* Easy for humans to understand - provide the foundation for the creation of human-understandable tags (element names) to markup data with meta-data.
* Efficient for computers to process – provide the structure that enforces a strict hierarchy that results in efficient computers processing
* Element names, attributes and element hierarchy add meaning to the data values contained within elements.
* Reduce data re-entry and manual processing.

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**XML SCHEMA**

**XML Schema Language -** an XML language used to write other XML languages and vocabularies and to create XML schema documents

**XML schema document** - a well-formed XML document, defining the rules that a class of XML documents must follow, as well as each element, attribute and the overall structure. Each element appearing in an XML document is defined in an XML schema and each schema has its own unique namespace identifier.

**XML vocabulary** - written in the XML Schema language and defining a specific element, attribute and the overall structure of XML documents for a particular purpose

**XML namespace** - a Universal Resource Identifier used to uniquely identify each XML vocabulary. XML namespaces are declared in the root element of an XML instance document as attributes and each namespace is assigned a unique prefix to qualify elements and attributes. Any element in the document without a prefix belongs to the default namespace.

(xmlns:prefix=”URI of namespace”)

<Order xmlns="UBLOrderDocument"

xmlns:cbc="UBLCommonBasicComponents"

xmlns:cac="UBLCommonAggregateComponents">

**XLink** – a language using attributes to describe relationships between elements in XML documents

**UBL Common Basic Components schema**

* all elements that are simple elements : <cbc:ID>1</cbc:ID>

<xs:schema xmlns:xs=http://www.w3.org/2001/XMLSchema

targetNamespace="UBLCommonBasicComponents"

xmlns ="UBLCommonBasicComponents"

elementFormDefault="qualified"

attributeFormDefault="unqualified">

<!-- ===== Simple elements ===== -->

<xs:element name=“ID” type=“xs:string”/>

* all elements that have simple content and an attribute (complex - attribute): <cbc: PriceAmount currencyID="USD">2</cbc: PriceAmount >

<!-- ===== Elements with simple contents and attributes ===== -->

<xs:element name="PriceAmount">

<xs:complexType>

<xs:simpleContent>

<xs:extension base="xs:decimal">

<xs:attribute name="currencyID" type="xs:string" use="required"/>

</xs:extension>

</xs:simpleContent>

</xs:complexType>

</xs:element>

**UBL Common Aggregate Components schema**

* complex elements used in UBL documents (complex - parent): <cac: Party>

<xs:schema xmlns:xs=http://www.w3.org/2001/XMLSchema

targetNamespace="UBLCommonAggregateComponents"

xmlns =" UBLCommonAggregateComponents "

xmlns:cbc ="UBLCommonBasicComponents"

elementFormDefault="qualified"

attributeFormDefault="unqualified">

<!-- ===== Import ===== -->

<xs:import namespace="UBLCommonBasicComponents" schemaLocation="http://www.buec.udel.edu/whitec/UBLCommonBasicComponents/UBLCommonBasicComponentsSchema.xsd"/>

<!-- ===== Aggregate elements ===== -->

<xs:element name="Party">

<xs:complexType>

<xs:sequence>

<xs:element ref="PartyName" minOccurs="1" maxOccurs="1"/>

<xs:element ref="PostalAddress" minOccurs="1" maxOccurs="1"/>

<xs:element ref="Contact" minOccurs="0" maxOccurs="1"/>

</xs:sequence>

</xs:complexType>

</xs:element>

**Data type**

* string
* Integer
* date
* decimal

**xs:schema** – root element

**targetNamespace** – tie this schema to … namespace

**elementFormDefault="qualified”** - element names will use a namespace prefix

**attributeFormDefault="unqualified”** - attribute names will not use a namespace prefix

**xs:import** – the import element identifies a local namespace and ties it to a URL so that the XML processor can find it

**xs:element** – every element must have a **name** and a **complexType**

**xs:sequence** – overall structure

**<xs:element ref="cbc:ID" minOccurs="1" maxOccurs="1"/>** - an element names ID in the imported cbc schema must occur one and only one time. (Empty element)

**Validation** - An instance document can be validated against the schema document to ensure the XML instance document is complete and properly structured according to its schema document.

Well Formed: VALID

Schema Validation: VALID

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**UBL**

**UBL – Universal Business Language**

UBL is an XML vocabulary of the standard, predefined element names, the content and the structure of common business documents to be used in e-business. UBL documents are not industry-specific, but provide a generic XML format for business documents that can be used between softwares and across industries.

It has exactly the same data as XML, but more elements and more nesting.

**Rules**

* One and only one Root Element
* One and only one ID
* One and only one IssueDate
* Two Party elements: SellerSupplierParty; BuyerCustomerParty (one and only one)
* At least one line element

**Required elements**

1. **Purchase order**

<Order>

* + <ID>
  + <IssueDate>
  + < BuyerCustomerParty >
    - <Party>
      * <PartyName>
      * <PostalAddress>
* < SellerSupplierParty >
  + - <Party>
      * <PartyName>
      * <PostalAddress>
* <OrderLine>

1. **Sales order**

<Order>

* + <ID>
  + **<SalesOrderID>**
  + <IssueDate>
  + < BuyerCustomerParty >
    - <Party>
      * <PartyName>
      * <PostalAddress>
* < SellerSupplierParty >
  + - <Party>
      * <PartyName>
      * <PostalAddress>
* <OrderLine>

**Attribute**s – required on elements that contain monetary amounts and object measurements

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**XBRL**

**XBRL - Extensible Business Reporting Language**

XBRL is an XML vocabulary for defining the structure and contents of accounting, finance, and business reports, making it understandable, reusable and precisely interpretable by computer applications.

* X - Extensible: Tags extend use beyond original intended use
* B - Business: Financial Statement Reporting
* R - Reporting: US GAAP
* L - Language: XML

**Advantages**

* XBRL tagged data can be more effectively reported, stored, processed, and communicated over networks.
* XBRL tagged data need not be re-entered and can be communicated in its original form.
* XBRL instances document can be validated, analyzed, and used for multiple purposes by multiple parties.
* XBRL benefits all members of the financial reporting supply chain.

**XBRL Specification 2.1** - the most recent XBRL specification defining rules and syntax for XBRL instance documents, taxonomies and linkbases. The XBRL Specification includes a schema which define elements and the structure of all XBRL instance documents and schemas defining XBRL taxonomies.

**XBRL Instance Document** - an instance of a class of XML documents containing data tagged with predefined elements representing accounting and financial concepts in financial reports (financial statements, block disclosures and detailed disclosures) by a specific entity, at a specific entity, at a specific point in time, in a specific currency, and for a specific purpose.

All XBRL instance documents must be well-formed and valid XML documents because they must follow the rules for all XML documents, as well as the rules for XBRL instance documents.

**XBRL Taxonomies** – is a dictionary of elements and their relationships for a specific reporting purpose, written in the XML Schema language. Each XBRL taxonomy includes a taxonomy schema, defining elements for a particular reporting purpose, and linkbases, defining relationships between elements.

Each tag used in an XBRL instance document must be defined as an element in XBRL taxonomy.

**Instance document structure**

* **root element and namespace declarations**
* <xbrli:xbrl – root element xbrli defined in the xbrli namespace
* xmlns:xbrli=“<http://www.xbrl.org/2003/instance>”– the contents and structure of all XBRL instance documents is defined (a schema)
* xmlns:link="http://www.xbrl.org/2003/linkbase” – the contents and structure of all XBRL linkbases is defined (a schema)
* xmlns:xlink="http://www.w3.org/1999/xlink"– the XML XLink language is defined (a schema)
* xmlns:iso4217="http://www.xbrl.org/2003/iso4217"– XBRL extends the standard international currency codes (a schema)
* xmlns:us-gaap="http://xbrl.fasb.org/us-gaap/2011"> – identify U.S. GAAP XBRL taxonomy (a schema)
* **schemaRef element**
* defined in the XBRL link namespace
* links an XBRL taxonomy schema to this XBRL instance document
* **context element**
* defined in the xbrli namespace
* id attribute starting with a letter
* establishes the "reporting context" of an XBRL instance document by identifying the entity doing the reporting and the instant or duration of time that applies to the data items being reported
* **unit element**
* defined in the xbrli namespace
* indentifies the units in which a numeric item is measured

<xbrli:unit id="USD">

<xbrli:measure>iso4217:USD</xbrli:measure>

</xbrli:unit>

OR

<xbrli:unit id="shares">

<xbrli:measure>xbrli:shares</xbrli:measure>

</xbrli:unit>

* **XBRL item**

**Rules for choosing a XBRL element**

* Use elements from the U.S. GAAP XBRL taxonomy whenever possible
* Read documentation description
* Choose the element with the narrowest definition of the fact you are reporting
* Consider using a line item element on the financial statements before a disclosure element
* If using a disclosure element, use software to move it as a financial statement line element.

**Decimal**

|  |  |
| --- | --- |
| in thousand | decimals="-3" |
| in million | decimals="-6" |
| accurate value | decimals="INF" or decimals="2" |
| percent | decimals="2" |

**Five industry entry points**

* Commercial and Industrial
* Banking and Saving Institutions
* Brokers and Dealers
* Insurance
* Real Estate

**XBRL Linkbases** – define relationships for accounting and financial reporting concepts, written in the XML XLink language.

* Presentation – how elements appear in published financial statements
* Calculation - how a series of elements sum up to another element
* Dimension – How to create tables for footnote disclosures
* Reference – provides relationships between elements and external regulations or standards
* Label –elements are connected to human readable labels

**Four levels tagging**

* Level : First year filer; Block Tagging, along with formatting
* Level 2: Second year filers; Tag each accounting policy, along with formatting
* Level 3: Second year filers; Tag each table, along with its formatting
* Level 4: Second year filers; Tag each monetary value, % and number in the footnotes.

**US GAAP XBRL 2011 taxonomy** – was maintained by XBRL US; now maintained by FASB (2010)

**Non-US GAAP taxonomy** – now maintained by SEC

SEC does not require the XBRL tagged financial s to be audited.

**XBRL mandated filing (3-year phase-in)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Company Type** | **Financial Statements** | **Block Footnotes** | **Detailed Footnotes** |
| > 500 Billion in outstanding | 12-15-2009 | 12-15-2009 | 12-15-2010 |
| Large Companies | 12-15-2010 | 12-15-2010 | 12-15-2011 |
| Small and IFRS reporting companies | 12-15-2011 | 12-15-2011 | 12-15-2012 |

**Validation (3 steps)**

* Validating the XBRL instance document against XBRL taxonomy schema
* Validating against additional schemas (xbrli document schema, US GAAP schema)
* Validating relationships, calculations and dimensions against the linkbases

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**XSLT**

**XSLT – Extensible Stylesheet Language for Transformations**

XSLT is a subset of the XSL language that is used to create Stylesheets and to transform XML instance documents into a presentation format.

* X - Extensible: Tags extend use beyond original intended use
* S – Stylesheet: What the data will look like
* L - Language: Scripting
* T - Transformations: Reuse, Repurpose, calculate, sort, etc.

**Input**: XML source document (containing elements, data values, but no format info) and XSLT document

**Output**: XML result document

**<?xml-stylesheet type="text/xsl" href="MyBikesReport.xsl"?> -** connects the source document to the Stylesheet to be transformed (additional prolog statement in the instance document)

**<xsl:template match="/">**  - start the transformation process by matching to the entire source document

**<BR/>** - an empty element that adds a line break in the resulting Web page

**<TR>** - insert a new row in the table

**<TH>** - column header

**<TD>** - insert a new column in the row

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**IFRS XBRL**

**Differences**

* Rules-based standard – detailed guidance

Principles-based – professional judgment (excluding documentation; including disclosures & example references)

* IFRS presents non-current assets and liabilities before current

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**iXBRL**

iXBRL is XBRL tagged information within a HTML document

* F/S data values are contained with iXBRL elements and the <iXBRL> tags are embedded with the <HTML> or <XHTML) tags
* Web Browser ignores the <iXBRL> elements, but processes the <HTML>
* iXBRL Processor converts the <iXBRL> elements to XBRL Instance Documents, to generate XBRL from iXBRL without reference to XBRL taxonomy

**Advantages**

* Document in iXBRL format is rendered as a Web page instead of as an XBRL document, therefore humanly-readable
* Eliminate the need to create an instance document of XBRL tagged financial statements data

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**XBRL – GL**

XBRL Global Ledger is a combination of taxonomies developed and recognized by XBRL International as the standard way to represent the detailed data behind the Financial Reports (Chart of Accounts, Journal Entries, Source Documents, any financial information). It could be called XBRL Detailed Data and is valuable for internal, as well as external, reporting.

More than merely standardizing a "general ledger", XBRL GL was designed to help businesses to move information between, into and out from their accounting systems to integrate with external systems and share information with their accountants and external advisors.

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**GENERAL**

**Tags** - add meaning to raw data and transfer it as information

**Meta-Data** - marked-up (tagged) data describing data by adding meaning to it

**Meta-Language** - A language that can be used to create other vocabularies

* Universal Business Language (UBL)
* Extensible Business Reporting Language (XBRL)

**Vocabulary -** a special purpose language

**Financial Reporting Supply Chain** - all stages of the preparation, approval, audit, analysis, and use of financial reports.

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